1. A receiver comprising:

a bank of correlators for receiving a signal that is a linear combination of a set of signature signals that has undergone some distortion; and

a correlation shaper operating on a vector output from the bank of correlators.

2. The receiver of claim **1**, wherein the bank of correlators is a decorrelator receiver.

3. The receiver of claim **1**, wherein the bank of correlators is a matched filter receiver.

4. The receiver of claim **1,** wherein the correlation shaper is a whitening transformation.

5. The receiver of claim **4,** wherein the whitening transformation is determined by minimizing the mean squared error between the vector output from the bank of correlators and an output vector from the correlation shaper.

6. The receiver of claim **1,** wherein the correlation shaper is comprised of a transformation, the transformation being determined by minimizing the mean squared error between the vector output from the bank of correlators and an output vector of the correlation shaper.

7. The receiver of claim **1,** wherein the correlation shaper is chosen so that a covariance matrix of an output vector of the correlation shaper has the property that the second and subsequent rows are permutations of the first row.

8. The receiver of claim **7,** wherein the correlation shaper is also chosen by minimizing the mean squared error between the vector output from the bank of correlators and the output vector from the correlation shaper.

9. The receiver of claim **1,** wherein the correlation shaper is a subspace whitening transformation.

10. The receiver of claim **9,** wherein the subspace whitening transformation is determined by minimizing the mean squared error between the vector output from the bank of correlators and an output vector from the correlation shaper.

11. The receiver of claim **6,** wherein the transformation is performed on a subspace.

12. The receiver of claim **1,** wherein the correlation shaper is chosen so that a covariance matrix of a representation of an output vector from the correlation shaper in the space in which it lies has the property that the second and subsequent rows are permutations of the first row.

13. The receiver of claim **12,** wherein the correlation shaper is determined by minimizing the mean squared error between the vector output from the bank of correlators and the output vector from the correlation shaper.

14. The receiver of claim **1,** wherein the bank of correlators cross-correlates the received signal with a set of orthogonal signals.

15. The receiver of claim **14,** wherein the set of orthogonal signals is determined by minimizing the least-squares error between the set of orthogonal signals and the set of signature signals.

16. The receiver of claim **14,** wherein the set of orthogonal signals is determined by minimizing the least-squares error between the set of orthogonal signals and a set of decorrelator signals.

17. The receiver of claim **1,** wherein the bank of correlators cross-correlates the received signal with a set of geometrically uniform signals.

18. The receiver of claim **17,** wherein the set of geometrically uniform signals is determined by minimizing the least-squares error between the set of geometrically uniform signals and the set of signature signals.

19. The receiver of claim **17,** wherein the set of geometrically uniform signals is determined by minimizing the least-squares error between the set of geometrically uniform signals and a set of decorrelator signals.

20. The receiver of claim **1,** wherein the bank of correlators cross-correlates the received signal with a set of projected orthogonal signals.

21. The receiver of claim **20,** wherein the set of projected orthogonal signals is determined by minimizing the least-squares error between the set of projected orthogonal signals and the set of signature signals.

22. The receiver of claim **20,** wherein the set of projected orthogonal signals is determined by minimizing the least-squares error between the set of projected orthogonal signals and a set of decorrelator signals.

23. The receiver of claim **1,** wherein the bank of correlators cross-correlates the received signal with a set of projected geometrically uniform signals.

24. The receiver of claim **23,** wherein the set of projected geometrically uniform signals is determined by minimizing the least-squares error between the set of projected geometrically uniform signals and the set of signature signals.

25. The receiver of claim **23,** wherein the set of projected geometrically uniform signals is determined by minimizing the least-squares error between the set of projected geometrically uniform signals and a set of decorrelator signals.

26. The receiver of claim 1, further comprising a bank of detectors operating on the output from the correlation shaper.

27. A method for processing signals in a multi-signature system comprising the steps of:

receiving a signal that is a linear combination of a set of signature signals that has undergone some distortion;

processing the received signal to obtain a vector output; and

shaping the correlation of the vector output.

28. The method of claim **27**, wherein shaping the correlation of the vector output further comprises the step of performing a whitening transformation on the vector output.

29. The method of claim **28**, wherein performing the whitening transformation further comprises the step of minimizing the mean squared error between the vector output and an output vector from the whitening transformation.

30. The method of claim **27,** wherein shaping the correlation of the vector output further comprises the step of performing a transformation on the vector output, wherein the transformation is determined by minimizing the mean squared error between the vector output and an output vector of the transformation.

31. The method of claim **27,** wherein shaping the correlation of the vector output further comprises the step of performing a transformation of the vector output such that the covariance matrix of the vector output of the transformation has the property that the second and each subsequent row is a permutation of the first.

32. The method of claim **31**, wherein performing the transformation further comprises the step of minimizing the mean squared error between the vector output and the output vector from the transformation.

33. The method of claim **27**, wherein shaping the correlation of the vector output further comprises the step of performing a subspace whitening transformation on the vector output.

34. The method of claim **33,** wherein performing the subspace whitening transformation further comprises the step of minimizing the mean squared error between the vector output and an output vector from the subspace whitening transformation.

35. The method of claim **27**, wherein shaping the correlation of the vector output further comprises the step of performing a transformation of the vector output such that the covariance matrix of the representation of the output vector of the transformation on the space in which it lies has the property that the second and each subsequent row is a permutation of the first.

36. The method of claim **35**, wherein performing the transformation further comprises the step of minimizing the mean squared error between the vector output and the output vector from the transformation.

37. The method of claim **27,** wherein shaping the correlation of the vector output further comprises the step of cross-correlating the received signals with a set of orthogonal signals.

38. The method of claim **37,** further comprising the step of minimizing the least-squares error between the signature signals and the set of orthogonal signals.

39. The method of claim **37**, further comprising the step of minimizing the least-squares error between the set of orthogonal signals and a set of decorrelator signals.

40. The method of claim **27,** wherein shaping the correlation of the vector output further comprises the step of cross-correlating the received signal with a set of geometrically uniform signals.

41. The method of claim **40,** further comprising the step of minimizing the least-squares error between the signature signals and the set of geometrically uniform signals.

42. The method of claim **40**, further comprising the step of minimizing the least-squares error between the set of geometrically uniform signals and a set of decorrelator signals.

43. The method of claim **27,** wherein shaping the correlation of the vector output further comprises the step of shaping the correlation of the vector output on a subspace by cross-correlating the received signals with a set of projected orthogonal signals.

44. The method of claim **43**, further comprising the step of minimizing the least-squares error between the set of projected orthogonal signals and the signature signals.

45. The method of claim **43,** further comprising the step of minimizing the least-squares error between the projected orthogonal signals and a set of decorrelator signals.

46. The method of claim **27,** wherein shaping the correlation of the vector output further comprises the step of shaping the correlation of the vector output on a subspace by cross-correlating the received signal with a set of projected geometrically uniform signals.

47. The method of claim **46,** further comprising the step of minimizing the least-squares error between the projected geometrically uniform signals and the signature signals.

48. The method of claim **46,** further comprising the step of minimizing the least-squares error between the projected geometrically uniform signals and a set of decorrelator signals.